REMARKS

Claims 1-25 are currently pending in the subject application and are presently under consideration. A clean version of all pending claims is found at pages 2-7. Claims 1, 2, 9, 12, 17 and 23 have been amended herein. A marked-up version of claim amendments made herein is found on pages 14-15 of this Reply.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I. Objected Claims 2-6 and 9

Claims 2-6 and 9 are objected to as being indefinite for insufficient antecedent basis for a limitation in claim 2 (from which claims 3-6 and 9 depend from).

Applicants have amended claim 2 (from which claims 3-6 and 9 depend from) to establish antecedent basis and overcome this rejection. Accordingly, withdrawal of this rejection is respectfully requested.

II. Rejection of Claims 1-25 Under 35 U.S.C. 102(b)

Claims 1-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Good, *et al.* (US 4,943,827) (hereinafter known as "Good"). Applicants' representative respectfully traverses this rejection and submits that it should be withdrawn for at least the following reasons. Good does not disclose each and every element recited in the respective claims.

> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

With regard to independent claims 1, 12, 17 and 23 (and claims 2-11, 13-16, 18-22, and 24-25 which depend therefrom, respectively), the Examiner states that Good discloses "a control system (Fig. 2, ref.#54) operative to receive temperature information

indicative of the temperature characteristics sensed by the temperature sensor, the control system being operative to control the exposing source based on the temperature information." (column 2, lines 41-46). Applicants have amended claim 1 (and similarly independent claims 12, 17 and 23) to now read, "a control system operative to receive temperature information indicative of the temperature characteristics sensed by the temperature sensor, the control system being *proactively* operative to control the exposing source based on the temperature information." These amendments more distinctly point out the present invention as stated in the specification at page 5, lines 23-25, "*the control system 16 can discern an appropriate value for exposure time in real time as a function of the sensed reticle temperature relative to the stored data.*" To the contrary, Good discloses, "The digital signals corresponding to sensor inputs are next directed to a read only memory 66 ..." and "The contents of memory 66 are *predetermined* for the range of temperature and humidity values *expected* in the environment in which the system will operate." (col. 8, lines 50-52) (emphasis added). In other words, Good can only *react* to a given temperature.

Additionally, with regard to independent claims 1, 12, 17 and 23 (and claims 2-11, 13-16, 18-22, and 24-25 which depend therefrom, respectively), the Examiner states that Good discloses "... a temperature sensor (Fig. 2, ref.#50) operative to sense temperature characteristics of the substrate ..." Applicants have amended claim 1 (and similarly independent claims 12, 17 and 23) to now read, "a temperature sensor operative to *proximally* sense temperature characteristics of the substrate, *including during an exposure cycle*." These amendments more distinctly point out the present invention as stated in the specification at page 4, lines 24-29 "*The temperature sensors 14 can be operatively coupled to the reticle 12 and sense temperature by conduction. Alternatively or additionally, the sensors 14 can be spaced apart from the reticle to discern an indication of reticle temperature by a noncontact temperature sensing technique ...* ". The present invention also states, "the temperature information can be collected *during* one or more exposure cycles ..." (page 3, lines 3-4) (emphasis added). To the contrary, Good discloses, "... it is preferred that sensor 50 be located to *sense the ambient air temperature*." (col. 7, line 68 and col. 8, lines 1-2). Good also states, "A temperature ...

sensor is provided for sensing the temperature ... exposure environment *prior to exposure*." (abstract) (emphasis added) (see also: col. 2, lines 42-43; lines 55-56). In other words, Good monitors ambient air temperature prior to exposure to control exposure times. For these reasons, and the reasons stated *supra*, Good does not teach each and every element of the present invention. Applicants respectfully request that this rejection be withdrawn.

III. Rejection of Claims 1-25 Under 35 U.S.C. 102(b)

Claims 1-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Mori, *et al.* (US 5,610,965) (hereinafter known as "Mori"). Applicants' representative submits that this rejection should be withdrawn for at least the above and the following reasons.

With regard to independent claims 1, 12, 17 and 23 (and claims 2-11, 13-16, 18-22, and 24-25 which depend therefrom, respectively), the Examiner states that Mori discloses "a control system (Fig. 1, ref.#11) operative to receive temperature information indicative of the temperature characteristics sensed by the temperature sensor, the control system being operative to control the exposing source based on the temperature information." (column 2, lines 41-46). Applicants have amended claim 1 (and similarly independent claims 12, 17 and 23), as stated *supra*, to more distinctly point out the present invention as stated in the specification at *id*. To the contrary, Mori discloses, a "... *predetermined* temperature ..." threshold for controlling the exposure source (*e.g.*, col. 3, line 56; col. 4, lines 15-16; col. 5, line 11; col. 5, lines 15-16) (emphasis added), a "... *predetermined* range ..." (col. 5, lines 24-25) and " ... a *predetermined* amount ..." (col. 5, line 54). In other words, Mori can only control by *reacting* to a given *predetermined* temperature. The present invention can correlate the temperatures sensed; past, present and in different zones; and proactively control the exposure source (see page 13, lines 1-10).

Additionally, with regard to independent claims 1, 12, 17 and 23 (and claims 2-11, 13-16, 18-22, and 24-25 which depend therefrom, respectively), the Examiner states that Mori discloses "... a temperature sensor (Fig. 1, ref.#5) operative to sense temperature characteristics of the substrate ..." Applicants have amended claim 1 (and

similarly independent claims 12, 17 and 23), as stated *supra*, to more distinctly point out the present invention as stated in the specification at *id*. To the contrary, Mori discloses, "... a temperature sensor 5 *fixed* on the *mask stage* 3 ..." (col. 2, lines 34-35) (emphasis added) and "... a temperature sensor 6 *fixed* on the *wafer stage* ..." (col. 8, lines 50-52) (emphasis added). In other words, Mori only monitors temperature of an *adjacent* structure at a *fixed point* location. Mori actually senses the stage temperatures rather than the substrate itself. For these reasons, and the reasons stated *supra*, Mori does not teach each and every element of the present invention. Applicants respectfully request that this rejection be withdrawn.

IV. Rejection of Claims 1-25 Under 35 U.S.C. 102(b)

Claims 1-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyai, *et al.* (US 5,581,324) (hereinafter known as "Miyai"). Applicants' representative submits that this rejection should be withdrawn for at least the following reasons.

With regard to independent claims 1, 12, 17 and 23 (and claims 2-11, 13-16, 18-22, and 24-25 which depend therefrom, respectively), the Examiner states that Miyai discloses "a control system (Fig. 1, ref.#20,54) operative to receive temperature information indicative of the temperature characteristics sensed by the temperature sensor, the control system being operative to control the exposing source based on the temperature information (column 2, lines 41-46)." Applicants have amended claim 1 (and similarly independent claims 12, 17 and 23), as stated *supra*, to more distinctly point out the present invention as stated in the specification at *id*. To the contrary, Miyai discloses, "a control system *for calculating a change amount of the imaging state* caused by the change in temperature." (col. 3, lines 22-23) (emphasis added). In Miyai, imaging state (*i.e.*, "imaging characteristics") is described as "the magnification, focal length, and the like of a projection optical system." (col. 1, lines 45-46). In other words, Miyai's control system is used to *refocus* a projection system to compensate for thermal distortions. The present invention provides "a control system operative to receive temperature information indicative of the temperature characteristics sensed by the temperature sensor, the control system being proactively operative to control *the exposing*

source based on the temperature information." Thus, the present invention can "correlate exposure time for different parts of the reticle and temperature for the respective different parts, such as over one or more previous exposure cycles." (page 5, lines 21-23) and "the exposure time can be decreased for a subsequent exposure cycle if the sensed temperature data indicates a temperature condition that exceeds a threshold ... or alternatively, ... the exposure time can be increased for a subsequent exposure cycle." (page 5, lines 25-29). Miyai does not disclose this element of the present invention.

Additionally, with regard to independent claims 1, 12, 17 and 23 (and claims 2-11, 13-16, 18-22, and 24-25 which depend therefrom, respectively), the Examiner states that Miyai discloses "... a temperature sensor (Fig. 1, ref.#53) operative to sense temperature characteristics of the substrate ..." Applicants, as stated *supra*, have amended claim 1 (and similarly independent claims 12, 17 and 23) to more distinctly point out the present invention as stated in the specification at *id.* To the contrary, Miyai discloses, "... by receiving infrared rays ..., a change in temperature of the reticle R ... is measured. Infrared rays ... are transmitted *through the dichoroic mirror 12 and are then reflected by a mirror 51* ... the reflected infrared rays are incident on a temperature sensor 53 *via a lens 52*." (col. 8, lines 28-36) (emphasis added). In other words, Miyai does *not proximally* monitor the substrate as found in the present invention. For these reasons, and the reasons stated *supra*, Miyai does not teach each and every element of the present invention. Applicants respectfully request that this rejection be withdrawn.

V. Conclusion

The present application is believed to be in condition for allowance in view of the above amendments and comments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

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MARKED UP VERSION OF AMENDED CLAIMS

1. (Amended) A system for regulating substrate temperature, comprising:

an exposing source operative to expose a substrate;

a temperature sensor operative to proximally sense temperature characteristics of the substrate, including during an exposure cycle; and

a control system operative to receive temperature information indicative of the temperature characteristics sensed by the temperature sensor, the control system being proactively operative to control the exposing source based on the temperature information.

2. (Amended) The system of claim 1, the exposing source further being operative to expose the [reticle]substrate during a plurality of exposure cycles, the control system employing temperature information associated with at least one of current and previous exposure cycles to control the exposing source during a subsequent exposure cycle.

9. (Amended) The system of claim [2]8, the plurality of temperature sensors being integrated into part of the substrate.

12. (Amended) A system for regulating temperature of a reticle or mask during exposure, comprising:

an exposing source spaced apart from and oriented to emit radiation during an exposure cycle having an exposure time period;

a temperature sensor associated with the reticle or mask and operative to proximally sense temperature of the reticle or mask and provide a temperature signal indicative thereof, including during an exposure cycle; and

a control system proactively operative to discern a temperature condition of the reticle or mask based on the temperature signal, the control system storing data indicative of the temperature condition during at least some of the exposure cycles, the control

system employing the stored temperature condition data and the discerned temperature condition of the reticle or mask to control the exposure time period.

17. (Amended) A system for regulating substrate temperature, comprising:

means for proximally sensing temperature of a substrate and for providing temperature information indicative thereof, including during an exposure cycle;

means for exposing the substrate with radiation; and

control means for proactively controlling operation of the means for exposing based on the temperature information provided by the means for sensing temperature.

23. (Amended) A method for regulating substrate temperature, comprising:

exposing a substrate with radiation;

sensing proximal temperature of the substrate and providing temperature information indicative of the sensed temperature, including during an exposure cycle; and

controlling the exposing in a subsequent exposure cycle proactively based on the temperature information associated with at least one of current and previous exposure cycles.